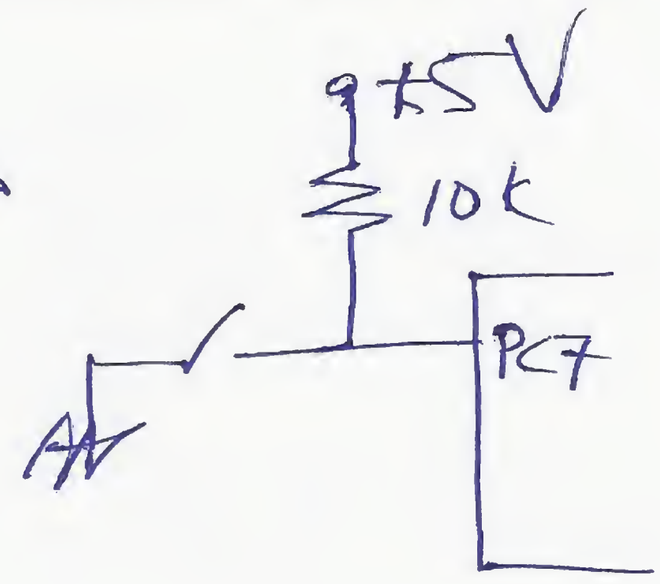
Q1. Assume the following 7-segment truth table. Connect the 7-segment display pins (a to g) to port B of the PPI. Connect a selector switch to pin PC_7 of the PPI. Write an **OPTIMUM** program to repeatedly display, at 1Hz rate, 0 1 2 3 4 5 6 7 8 9 (i.e. counting up) when the switch is ON (ON = 0) or to display 9 8 7....etc...2 1 0 (i.e. counting down) when the switch is OFF (OFF = 1) at 0.5 Hz rate.

Draw CLEARLY the switch circuit **only**.

D	C	B	A	g	f	e	d	c	b	a	
0	0	0	0	0	1	1	1	1	1	1	3F
0	0	0	1	0	0	0	0	1	1	0	06
0	0	1	0	1	0	1	1	0	1	1	5B
0	0	1	1	1	0	0	1	1	1	1	4F
0	1	0	0	1	1	0	0	1	1	0	:
0	1	0	1	1	1	0	1	1	0	1	:
0	1	1	0	1	1	1	1	1	0	1	.
0	1	1	1	0	0	0	0	1	1	1	07
1	0	0	0	1	1	1	1	1	1	1	7F
1	0	0	1	1	1	0	1	1	1	1	6F



LET db 3F, 06, 5B, ..., 7F, 6F

Program PPI

```
        LEA   BX, LET
        MOV   DX, OFFE4h
BACK:   IN    AL, DX
        TEST  AL, 80h
        JNZ   DOWN
        MOV   DX, OFFE0h
        XOR   AL, AL
NEXT:   PUSH  AX
        XLAT
        OUT   DX, AL
        CALL  DLY1
        POP   AX
        INC   AL
        CMP   AL, 9
        JB    NEXT
        JMP   BACK
```

```
DOWN:
        MOV   DX, OFFE0h
        MOV   AL, 9
MORE:   PUSH  AX
        XLAT
        OUT   DX, AL
        CALL  DLY05
        POP   AX
        DEC   AL
        JNZ   MORE
        JMP   BACK
```